

Springless Diaphragm Valves (1.125 in.) For High Performance



DP Series

- 1.125 in. C-seal and W-seal designs
- Available in two- and three-port configurations
- Compact pneumatic and manual actuators

Features



Seat

Fully contained PFA seat design provides:

- enhanced purity and improved thermal stability
- excellent helium leak test performance
- minimal particle generation
- long cycle life.

Diaphragm

- Cobalt-based superalloy (UNS R30003) material for strength and corrosion resistance
- Optimal design for long cycle life.

Body

- 316L VIM-VAR stainless steel body material for ultrahigh-purity applications
- Fully swept flow path:
 - minimizes entrapment area
 - facilitates purging
 - maximizes flow capacity.

Actuators

- Normally closed and normally open pneumatic models
- Three-quarter-turn manual actuator lockable in the CLOSED position.

Technical Data

Working Pressure psig (bar)		Temperature Rating °F (°C)		Flow Coefficient (C _v)	Orifice in. (mm)	Internal Volume in. ³ (cm ³)	Pneumatic Actuator	
Operating	Burst	Operating	Short-Term Bakeout				Actuation Pressure psig (bar)	Air Displacement in. ³ (cm ³)
Vacuum to 125 (8.6)	4500 (310)	-10 to 302 (-23 to 150) ^①	392 (200) (valve open)	0.27	0.16 (4.1)	0.078 (1.28) (2-port) 0.105 (1.72) (3-port)	Normally closed 65 to 120 (4.5 to 8.2) Normally open 65 to 80 (4.5 to 5.5)	0.03 (0.49)

^① Maximum operating temperature with pneumatic actuator and electronic actuator-position sensor, page 4, is 158°F (70°C).

Process Specifications

See Swagelok® *Ultrahigh-Purity Process Specification (SC-01)*, MS-06-61, for details on process, process controls, and process verification.

Cleaning	Assembly and Packaging	Wetted Surface Roughness (R _a)	Testing
Ultrahigh-purity cleaning with a continuously monitored, deionized water, ultrasonic cleaning system	Performed in ISO Class 4 work areas; valves are double bagged and vacuum sealed in cleanroom bags	Electropolished and finished to an average of 5 μin. (0.13 μm)	Inboard helium leak tested to a rate of 1 × 10 ⁻⁹ std cm ³ /s at the seat, envelope, and all seals

Performance Specifications

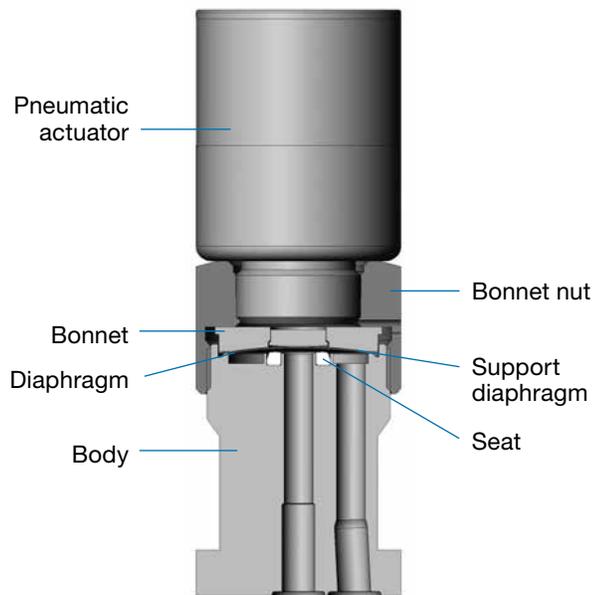
See the *DP Series Springless Diaphragm Valves (1.125 in.) Technical Report*, MS-06-21, for more information on helium leak testing, particle counting, moisture analysis, hydrocarbon analysis, ionic cleanliness, and lab cycle testing data.

Materials of Construction

Component	Grade / Specification
Bonnet nut	316 SS / ASTM A479
Bonnet	S17400
Support diaphragm	Silver-plated cobalt-based superalloy (UNS R30003) / AMS 5876
<i>Diaphragm</i>	<i>Cobalt-based superalloy (UNS R30003) / AMS 5876</i>
<i>Seat</i>	<i>Type II, high-purity grade PFA / ASTM D3307</i>
<i>Body</i>	<i>316L VIM-VAR SS / SEMI F20 Ultrahigh-Purity^①</i>
Lubricant	PTFE-based
Lockout Handle	
Handle	Powder-coated powdered metal 300 series SS
Handle pin	400 series SS
Button	316 SS
Button spring	S17700 SS
Pneumatic Actuator	
Cylinder, cap	Aluminum
Pistons	Powdered metal 300 series SS—normally open; aluminum—normally open and normally closed
Base	Powdered metal 300 series SS—normally open; none—normally closed
O-rings	Fluorocarbon FKM
Guide rings	PTFE
Springs	S17700 SS

Wetted components listed in *italics*.

① 20 % minimum elongation allowed.



Normally Closed Actuator Shown

Ordering Information and Dimensions

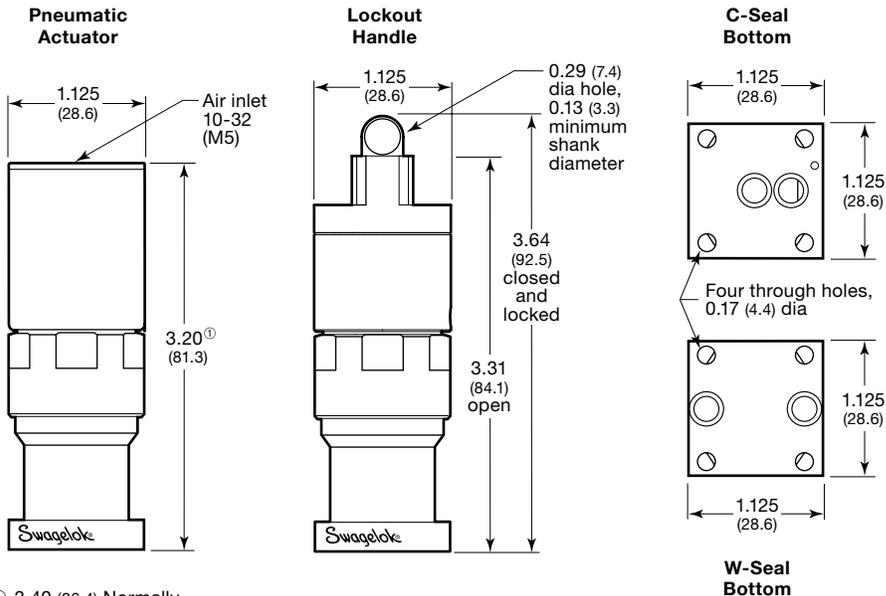
Dimensions, in inches (millimeters), are for reference only and are subject to change.

To order a valve with a manual (lockout) handle, select an ordering number.

Seal Design	Ordering Number
2-Port Manual (Lockout)	
C-seal	6LVV-MSM-DPEL-2-P
W-seal	6LVV-MSM-DPEL-W2-P
3-Port Manual (Lockout)	
C-seal	6LVV-MSM-DPEL-3-P
W-seal	6LVV-MSM-DPEL-W3-P

To order a valve with pneumatic actuation, remove the second **L** and add **-C** for a normally closed actuator or **-O** for a normally open actuator.

Example: 6LVV-MSM-DPE-2-P-**C**



① 3.40 (86.4) Normally closed pneumatic actuator with electronic actuator-position sensor.

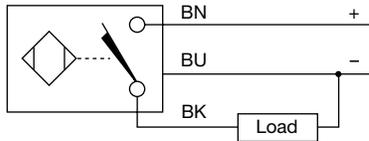
Electronic Actuator-Position Sensors

Electronic actuator-position sensors transmit a signal to an electrical device indicating the open position of pneumatically actuated valves. Sensors and electrical connectors described below are third-party products.

Sensor Technical Information

Output	3-wire V (dc)—transistor (current-sourcing)
Voltage	10 to 30 V (dc) polarity protected—pulsed SCP
Output Function	Normally open (NO)
Operating Temperature	-23 to 70°C (-10 to 158°F)

Wiring Diagram



Factory-Assembled Electronic Actuator-Position Sensors

To order an electronic actuator-position sensor factory assembled to a valve, add **S** to the valve ordering number.

Example: 6LVV-MSM-DPE-2-P-CS

Electrical connector is a short pigtail; a mating direct-current M8 3-wire push-on straight female connector is available.

Ordering number: **MS-CSK-BALF-1**

Electronic Actuator-Position Sensor Kits for Field Assembly

Kits for normally closed and normally open actuators are available. Kits for normally open actuators include a nut and star washer.

Actuation Mode	Sensor Electrical Connector	Kit Ordering Number
Normally closed	Short pigtail	MS-PSK-ALD3E-B
	Long cable with flying leads	MS-PSLK-ALD3E-B
Normally open	Short pigtail	MS-PSK-ALD-B
	Long cable with flying leads	MS-PSLK-ALD-B

Kits with short pigtail connector require a mating direct-current 3-wire push-on straight female connector.

Ordering number: **MS-CSK-BALF-1**

Safe Product Selection

When selecting a product, the total system design must be considered to ensure safe, trouble-free performance. Function, material compatibility, adequate ratings, proper installation, operation, and maintenance are the responsibilities of the system designer and user.

⚠ WARNING

Do not mix/interchange Swagelok products or components not governed by industrial design standards, including Swagelok tube fitting end connections, with those of other manufacturers.

Diaphragm Replacement Kits

Kits include two diaphragms and replacement instructions.

Kit ordering number: **E-3DK-DPE**

Warranty Information

Swagelok products are backed by The Swagelok Limited Lifetime Warranty. For a copy, visit swagelok.com or contact your authorized Swagelok representative.